

RESEARCH DEPARTMENT

THE SERVICE AREA OF THE MELDRUM TELEVISION TRANSMITTER

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## THE SERVICE AREA OF THE MELDRUM TELEVISION TRANSMITTER

### SUMMARY

The service area of the Meldrum television transmitter conforms with that predicted from the site tests. Most of north-east Scotland, east of a line from Burghead to Montrose, is within the nominal ( $100 \mu\text{V/m}$ ) service area. The east coast of Sutherland and part of Caithness receive a fringe service.

### 1. INTRODUCTION.

Meldrum is the second medium power television transmitter to come into full service. From 14th December 1954 a temporary service for Aberdeen and its environs was provided by a low power transmitter at Redmoss, the B.B.C. medium-wave station.

On 12th October 1955 Meldrum took over the service for Aberdeen and the whole of north-east Scotland.

### 2. GENERAL.

The Meldrum vision transmissions are provided by a 5 kW transmitter driving a three-tier superturnstile aerial. The mid-point of the aerial is 463 ft (141 m) above ground level and the site is 802 ft (244 m) above mean sea level. The transmission is horizontally polarised and radiated on a frequency of 61.75 Mc/s (Channel 4). A three-tier superturnstile aerial is nominally omnidirectional when the elements are fed in phase quadrature, but, in order to enhance the field strength in the City of Aberdeen, two opposing elements have been de-phased by  $40^\circ$ . The resultant horizontal radiation pattern is shown in Fig. 1, where the maximum and minimum e.r.p.'s are 17.3 kW and 4 kW respectively.

The survey was carried out by measuring the field strength of the vision transmitter with a horizontal loop aerial mounted 12 ft (3.7 m) above ground level but all field strengths quoted have been corrected to correspond to the peak-white value 30 ft (9.2 m) above ground level. At a few sites the field strength of the vision and sound transmitters was compared. The ratio was found to be, in general, 2:1.

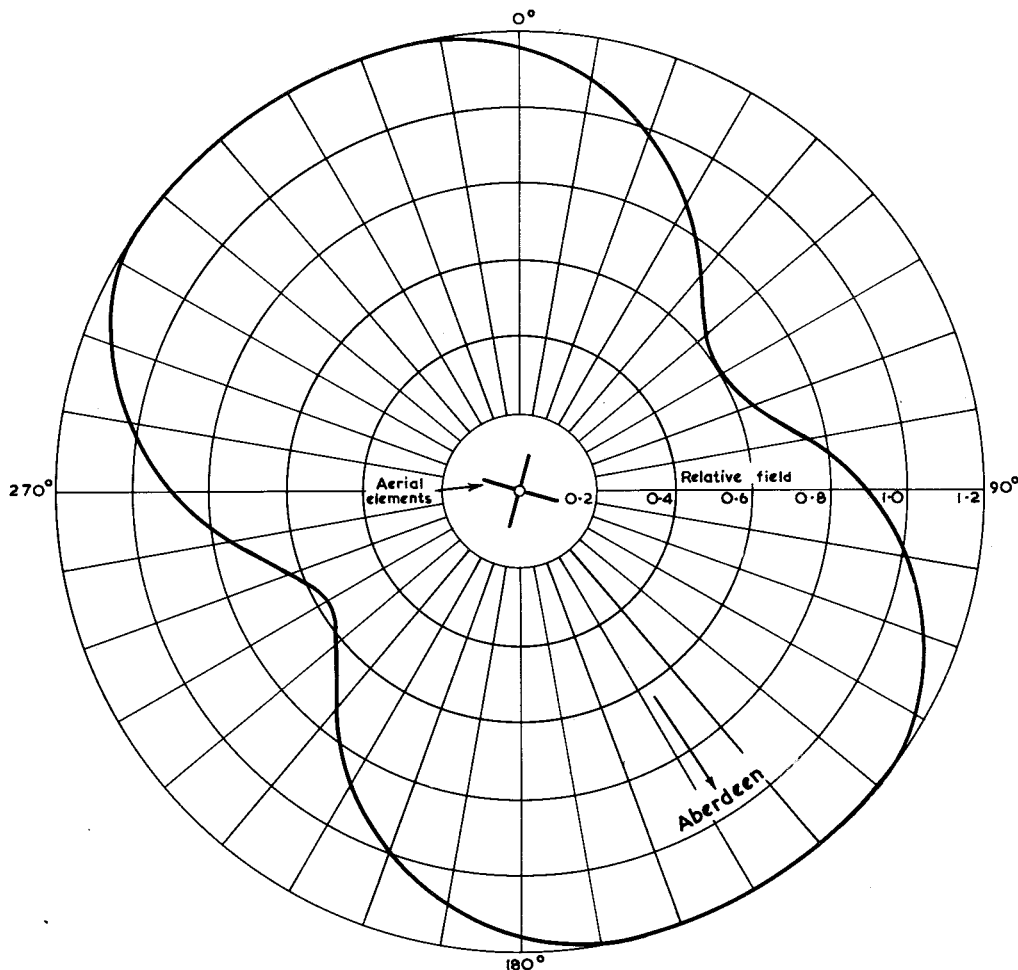


Fig. 1 - Meldrum three-tier superturnstile theoretical HRP  
for  $40^\circ$  de-phasing

Note: Unit field corresponds to 12 kW ERP (Vision)

### 3. RESULTS.

The results of the survey are presented in tabular form and in two field strength contour maps. Fig. 2 (map T.329) shows the coverage provided by Meldrum in the north of Scotland, the  $0.1 \text{ mV/m}$  contour of Kirk o' Shotts and the predicted  $0.1 \text{ mV/m}$  contour from Rosemarkie. Fig. 3 (map T.335) shows, in detail, the field strength distribution in the City of Aberdeen.

Referring to Fig. 2, it will be seen that most of north-east Scotland, east of a line between Burghead and Montrose, is within the  $0.1 \text{ mV/m}$  contour and a fringe area service is provided to the towns and villages on the east coast of Sutherland and parts of Caithness. Co-channel interference may, however, be expected from time



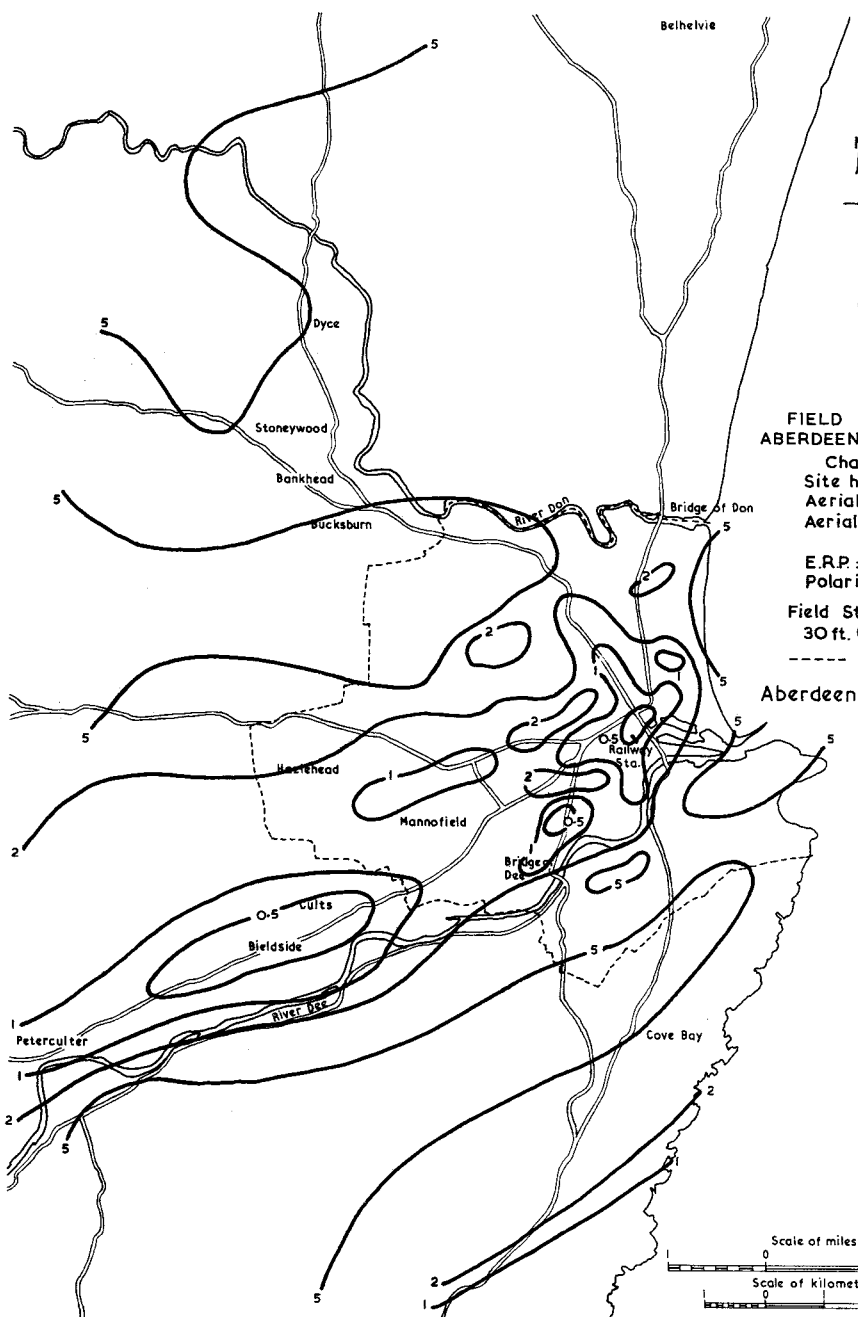


Fig. 3

# FIELD STRENGTH CONTOURS IN ABERDEEN FROM MELDRUM (MEASURED)

Channel 4 61.75 Mc/s  
 Site height: 802 ft. (244 m) AMSL  
 Aerial height: 463 ft. (141 m) AGL  
 Aerial: 3-tier superturnstile  
 (de-phased 40°)  
 E.R.P.: 4-17.3 kW  
 Polarisation: Horizontal

Field Strength contours are in mV/m  
 30 ft. (9.2 m) above ground level.

----- City boundary

to time when the Cumberland (Sandale) transmitter comes into service and the limit of the service area free from perceptible interference for 90% of the time is shown on Fig. 2. This boundary is based on the use of omnidirectional receiving aerials and the horizontal dipoles of viewers to the eastward of Meldrum will, of course, provide considerable discrimination against interference from the Cumberland transmitter. On the other hand, viewers near the southern limits of the service area (Montrose, Laurencekirk, Inverbervie, etc.) will have to use two or three element aerials if co-channel interference is not to be troublesome. Because of the weak signal such an aerial will be necessary in these areas for satisfactory reception of Meldrum, even in the absence of co-channel interference. When, therefore, account is taken of the discrimination viewers' aerials will provide, the interference limits shown in Fig. 2 may be regarded as pessimistic.

The population within the 5.0, 0.5 and 0.1 mV/m contours has been estimated by Engineering Information Department and is given below:

Field Strength mV/m	Population
5.0	60,600
0.5	332,800
0.1	462,800

From Fig. 2 (map T.329) it will be seen that there is a marginal overlap in the populated areas between the service area of Meldrum and the adjacent transmitters, Kirk o' Shotts in the south and the proposed Rosemarkie transmitter in the north.

The towns in the Grampian Mountains area, e.g., Grantown-on-Spey, Carrbridge, etc., are not served by Meldrum, and they will not be served by Rosemarkie.

The area to the north-east of Meldrum is very well served and the City of Aberdeen (2 mV/m) receives, on the whole, a very good service.

The field strength in the principal towns is given in Table 1.

Fig. 3 (map T.335) shows that most of the City of Aberdeen is well served by Meldrum. Two small areas, one in the business centre and one near the Bridge of Don, receive less than 0.5 mV/m but most of the residential areas receive at least 1 mV/m and, in many cases, more than 2 mV/m. Exceptions are the Deeside villages of Cults and Bieldside. Both these areas were well served by the temporary transmitter but the service now provided is very poor in certain localities.



TABLE 1

Field strength in mV/m  
at 30 ft (9.2 m) A.G.L.

Town	Max.	Median	Min.
Aberdeen . . . . .	31	2.0	0.14
Aberchirder . . . . .	35	14	4.0
Aboyne . . . . .	0.35	0.2	0.06
Arbroath . . . . .	0.08	0.02	0.01
Ballater . . . . .	0.16	0.06	0.02
Banchory . . . . .	5.6	0.25	0.07
Banff . . . . .	12	2.2	0.4
Bielside . . . . .	0.63	0.2	0.12
Braemar . . . . .	0.05	0.03	0.02
Brechin . . . . .	0.35	0.09	0.02
Buckie . . . . .	0.45	0.1	0.01
Craigellachie . . . . .	0.32	0.08	0.02
Cults . . . . .	0.71	0.25	0.1
Dornoch . . . . .	0.22	0.05	0.01
Dufftown . . . . .	0.2	0.05	0.02
Dyce . . . . .	14	7.0	2.0
Elgin . . . . .	1.0	0.25	0.06
Ellon . . . . .	31	8.9	2.0
Fochabers . . . . .	0.16	0.06	0.02
Forfar (South) . . . . .	0.45	0.12	0.02
Fraserburgh . . . . .	2.5	1.0	0.16
Grantown-on-Spey . . . . .	0.1	0.04	0.02
Helmsdale . . . . .	0.71	0.14	0.04
Huntly . . . . .	2.0	0.8	0.09
Invergordon . . . . .	0.11	0.05	0.02
Inverurie . . . . .	130	32	16
Keith . . . . .	3.5	0.71	0.1
Kintore . . . . .	31	11	2.8
Lossiemouth . . . . .	2.8	0.63	0.12
Macduff . . . . .	2.8	0.4	0.08
Montrose . . . . .	0.63	0.22	0.03
Nairn . . . . .	0.04	0.03	0.02
Peterculter . . . . .	2.5	0.56	0.22
Peterhead . . . . .	2.0	0.5	0.09
Rothies . . . . .	1.4	0.35	0.08
Stonehaven . . . . .	0.71	0.2	0.02
Strathdon . . . . .	1.0	0.08	0.01
Tain . . . . .	0.4	0.11	0.03
Tomintoul . . . . .	0.14	0.07	0.03
Torphins . . . . .	10	2.8	0.11
Turriff . . . . .	28	6.3	0.9
Wick . . . . .	0.32	0.05	0.01

#### 4. CONCLUSIONS.

The Meldrum television transmitter provides a service in north-east Scotland, east of a line between Burghead and Montrose, and a fringe area service to parts of Sutherland and Caithness.

When the Cumberland medium power transmitter comes into service co-channel interference may, from time to time, degrade the picture quality of viewers at the southern extremity of the service area.